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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ABANESHWAR PRASAD and RONALD E. MYERS

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Appeal 2009-010883  
Application 10/754,390  
Technology Center 3700

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Before LINDA E. HORNER, MICHAEL W. O'NEILL, and  
KEN B. BARRETT, *Administrative Patent Judges*.

O'NEILL, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

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<sup>1</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

## STATEMENT OF THE CASE

Abaneshwar Prasad and Ronald E. Myers (Appellants) seek our review under 35 U.S.C. § 134 of the final rejection of claims 1-21. We have jurisdiction under 35 U.S.C. § 6(b).

### *The Invention*

The claimed invention is to a polishing pad used in a chemical-mechanical polishing process.

Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. A chemical-mechanical polishing pad comprising a porous polymeric material, wherein the porous polymeric material has a Poisson's ratio less than 0.

### *The Prior Art*

The Examiner relies upon the following as evidence of unpatentability:

Furukawa	US 2005/0107007 A1 <sup>2</sup>	May 19, 2005
Osterheld	US 6,241,596 B1	Jun. 5, 2001
Sevilla	US 6,126,532	Oct. 3, 2000
Suzuki	US 6,120,353	Sep. 19, 2000
Reinhardt	US 6,095,902	Aug. 1, 2000
Tang	US 5,949,927	Sep. 7, 1999
Lakes	US 4,668,557	May 26, 1987

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<sup>2</sup> Both the Examiner and Appellants refer to the U.S. Patent Publication of Furukawa when maintaining and replying to the Examiner's ground of rejection under 35 U.S.C. § 103(a) rather than the translated version of WO 03/058698 A1.

*The Rejections*

The following Examiner's rejections are before us for review:

Claims 1-7 and 16-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Reinhardt, Lakes, and Furukawa.

Claims 8 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Reinhardt, Lakes, Furukawa, and Sevilla.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Reinhardt, Lakes, Furukawa, and Suzuki.

Claims 11-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Reinhardt, Lakes, Furukawa, and Osterheld.

Claims 14, 15, and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Reinhardt, Lakes, Furukawa, and Tang.

*Contentions*

Appellants argue the rejection of claims 1-7 and 16-20 as a group. App. Br. 3-6. We select claim 1 as representative and claims 2-7 and 16-20 will stand or fall with claim 1. Appellants essentially argue that neither Sevilla, Suzuki, Osterheld, nor Tang remedies the argued deficiency in the combined teachings of Reinhardt, Lakes, and Furukawa as noted on pages 3-6 of the Appeal Brief. App. Br. 6-9.

SUMMARY OF DECISION

We AFFIRM.

## DISCUSSION

### *Issue*

Would the problems known in the polishing art have led a person of ordinary skill in the art at the time the invention was created to combine the teachings of Reinhardt, Lakes, and Furukawa to develop a chemical-mechanical polishing pad made from a porous polymeric material having a Poisson's ratio less than zero?

### *Pertinent Facts*

1. The Specification discloses “a need for polishing pads having longer pad life with improved tear and abrasion resistance properties.” Spec. 2, para. [0005].
2. Appellants have provided for purposes of this appeal the level of ordinary skill in the art: “one of ordinary skill in the art can be treated as someone with an advanced chemistry degree and at least a few years of experience in the field of chemical-mechanical polishing of substrates.” App. Br. 4.
3. Appellants do not to contest the Examiner's finding that Reinhardt teaches porous polymer polishing pads. *See* App. Br. 3 (“Reinhardt generally discloses porous polishing pads comprising polyether and/or polyester polyurethanes.”)
4. Reinhardt is silent as to the Poisson's ratio of the polishing pads.
5. Lakes teaches a negative Poisson's ratio polymer material and a potential number of uses for that material and teaches that such material is far superior for use in situations in which a

combination of compliance and strength is required. *See* Col. 5, ll. 4-18.

6. However, Lakes, prior to the listed examples, teaches that “[t]he transformed foam material of the invention [the negative Poisson’s ratio polymer material] is compliant but it is also relatively dense, and therefore would be more advantageous than conventional foam materials in applications where superior strength and abrasion resistance are desired along with a compliant foam.” Col. 4, l. 66 to col. 5, l. 3. The Examiner identified this teaching in the rejection. *See* Ans. 4.
7. The Examiner states that “[i]t is well known in the art that superior strength and abrasion resistance are desired properties for polishing pads.” Ans. 4. The Examiner states that “Furukawa specifically discloses that high abrasion resistance is a requirement for long life of polishing pads (paragraph 8) and further teaches that polishing pads made of foamed polyurethane (such as the pads disclosed by Reinhardt) generally fail to have the desired abrasion resistance to provide long life of the polishing pad.” *Id.*
8. Appellants acknowledge Reinhardt’s polishing pads comprise polyurethane. App. Br. 3. Reinhardt does teach the polishing pads can be formed by foaming. Col. 2, ll. 45-48. Appellants further acknowledge that Furukawa teaches three requirements for polishing pads: “(1) high polishing speed, (2) long life of the polishing pad, i.e., polishing pad materials must have high abrasion resistance, and (3) high planarizing ability. . . .” App.

Br. 4. Appellants state that Furukawa teaches that “these three requirements can be achieved with a polishing pad comprising fabric and a *nonporous* resin . . . .” *Id.*

*Principles of Law*

In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103. One of the ways in which a patent’s subject matter can be proved obvious is by noting that there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent’s claims. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 419-20 (2007).

The Supreme Court admonished that

[t]he question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. *KSR*, 550 U.S. at 420.

*Analysis*

We note that there was a problem in the polishing art that polishing pads wear and as such there was a need to develop a polishing pad with longer pad life by having improved tear and abrasion resistance properties. Fact 1. A person of ordinary skill in the art is considered to be a person with an advanced chemistry degree and at least a few years of experience in the field of chemical-mechanical polishing of substrates. Fact 2. With these two facts at our immediate disposal and the above principles in mind, we

analyze whether a person having ordinary skill in the art would have found it obvious to combine teachings of Reinhardt, Lakes, and Furukawa in order to develop a chemical-mechanical polishing pad made from a porous polymeric material having a Poisson's ratio less than zero.

Appellants admit that Reinhardt teaches porous polymer polishing pads. Fact 3. As such, we find that a person having ordinary skill in the art as defined by Appellants would understand Reinhardt teaches porous polymer polishing pads. Reinhardt is silent as to the Poisson's ratio of the taught polishing pads. Fact 4. As such, it can be deduced that the Poisson's ratio of the taught polishing pads falls into one of three ranges: positive, zero, or negative.

Lakes teaches a negative Poisson's ratio polymer material and a potential number of uses for that material and teaches that such material is far superior for use in situations in which a combination of compliance and strength is required. Fact 5. Prior to the listing of the potential uses for the taught negative Poisson's ratio polymer material, Lakes teaches that the negative Poisson's ratio polymer material is both compliant and dense and thus more advantageous than conventional foam material. Fact 6. Lakes teaches that the negative Poisson's ratio material taught therein, by the treatment of a positive Poisson's ratio material, would be more advantageous in applications where superior strength and abrasion resistance are desired along with a foam. Fact 6. Since there is a need in the polishing art to develop a polishing pad with longer pad life by having improved tear and abrasion resistance properties (Fact 1) and Lakes teaches that the negative Poisson's ratio material would be more advantageous in applications where superior strength and abrasion resistance are desired along with a compliant



material (Fact 6), a person having ordinary skill in the art (*see* Fact 2) would readily appreciate the teachings of Lakes and could routinely experiment to develop a polishing pad, such as taught in Reinhardt, with a negative Poisson's ratio material since Reinhardt is silent on the Poisson's ratio and does not appear to discourage the use of a negative Poisson's ratio material.

It is acknowledged by both the Examiner and Appellants that Furukawa teaches that one of the requirements for polishing pad material is a high abrasion resistance. Facts 7 and 8. This teaching bolsters the position that a person having ordinary skill in the art (*see* Fact 2) would seek materials that have superior strength and abrasion resistance as evinced by Lakes that have negative Poisson's ratios in order to improve tear and abrasion resistance properties, which are known needs to a person having ordinary skill in the art (*see* Fact 1).

In view of the foregoing, we conclude that a claimed invention of a chemical-mechanical polishing pad comprising a porous polymeric material having a Poisson's ratio less than zero would have been obvious to a person having ordinary skill in the art at the time the invention was created given the need known in the art to improve the tear and abrasion resistance of polishing pads and the level of skill of a person having ordinary skill in the art given the teachings of Reinhardt, Lakes, and Furukawa.

The Examiner has properly relied on Furukawa's teachings in order to support the Examiner's statement that it is well known in the art that superior strength and abrasion resistance are desired properties for polishing pads. The Examiner has properly applied patent examining procedure by providing some technical support for the conclusion of fact stated previously by the Examiner.

We are not persuaded by Appellants' contentions against Lakes that essentially argue the teachings of Lakes are limited to the listed examples and the teachings of Furukawa are limited to polishing pads being comprised of fabric and a nonporous resin. These contentions are essentially an argument that in order to establish obviousness with a combination of references, a reference's entire teachings have to be bodily incorporated into another reference. Our reviewing court and its predecessor have admonished otherwise: "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). *See also In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) ("[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review."); *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) ("Combining the *teachings* of references does not involve an ability to combine their specific structures.") Moreover, as the Supreme Court has admonished, "if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR*, 550 U.S. at 417. Here, Lakes has an express teaching that is broader than the listed examples. (Facts 5, 7). Moreover, the facts indicate that a person of ordinary skill in the art is a person of high skill level. Fact 2. As such, a person of ordinary skill in the art could readily adapt the teachings of Lakes, which yields a desired solution to a known need in the art, to similar materials to develop

polishing pads for substrates, as taught in Reinhardt, that have the desired solution of superior strength and abrasion resistance, which fulfills the requirements of polishing pads as suggested by Furukawa (Fact 9), absent any evidence that such development is beyond routine experimentation.

In light of the legal principles above, we are unconvinced that the holding in *Wesslau* weighs in favor of concluding nonobviousness since Appellants have not explained how the facts in that case are commensurate to the facts within this appeal.

In view of the foregoing, we sustain the Examiner's rejection of claim 1 as unpatentable over Reinhardt, Lakes, and Furukawa. Claims 2-7 and 16-20 fall with claim 1. Appellants' arguments concerning the rejections of claims 8-15 essentially rely on the arguments for demonstrating error in the obviousness rejection of claims 1-7 and 16-20. Our reasoning for holding that the Examiner did not err in rejecting claims 1-7 and 16-20 answers these arguments as well. As such, our reasoning is equally applicable and we sustain the Examiner's rejections of claims 8-15 as unpatentable given the further teachings Sevilla, Suzuki, Osterheld, and Tang when combined with the teachings of Reinhardt, Lakes, and Furukawa as the Examiner has rejected and articulated the reasoning therefor in the Answer.

We have considered Appellant's other arguments in the Appeal Brief, Reply Brief, and Supplemental Reply Brief; however, in view of the foregoing, we do not find any of them persuasive to demonstrate that the claimed invention would not have been obvious to a person of ordinary skill in the art at the time of the invention based on the known problems within the polishing art, the combined teachings of the prior art, and level of ordinary skill in the art.

### CONCLUSION

The problems known in the polishing art would have led a person of ordinary skill in the art at the time the invention was created to combine the teachings of Reinhardt, Lakes, and Furukawa in order to develop a chemical-mechanical polishing pad made from a porous polymeric material having a Poisson's ratio less than zero.

### DECISION

The Examiner's decision to reject claims 1-21 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

### AFFIRMED

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